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Translating Quality Care Factors to Quality Space: Design criteria for outpatient facility

Zanariah Abu Samah*, Norhati Ibrahim, Jazman Shah Amir

Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA Shah Alam 40450, Malaysia

Abstract

This paper is concerned with the design aspects of an Outpatient Facility, in terms of how to translate quality care concept, to space and interior design characteristics. The paper argues that making explicit aspects of the interior space design that are responsive to the concept of quality care is crucial for the benefit of improving existing facilities as well as future design. There is no locally drawn guideline for the design of healthcare facilities. This paper reviews foreign guidelines with the aim to consolidate key aspects of space design characteristics to support the quality care concept for outpatient facility.

Keywords: Quality care; quality space; out patient facility; building performance

1. Introduction

Healthcare providers in Malaysia include the public and private sector, where a majority of the Malaysian population relies on the public healthcare. The public healthcare is subsidized by the government that enables patients to gain treatment at a nominal cost. The Ministry of Health (MoH) is the main government agency responsible to provide healthcare services in the country. There are four types of public sector hospitals under the care of the MOH (Ministry of Health), namely district hospitals, state general hospitals, national referral centers, and special institutions. The planning and design of healthcare facility in Malaysia is subjected to reforms since the beginning of the 1990s. It started with the concept

* Corresponding author. Tel.: +6-012-626-3168; fax: +6-03-5544-4353 .
E-mail address: zanari02@salam.uitm.edu .

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of home away from home, which later shifted towards patient centred and, currently aiming towards a holistic environment with high quality health system as expressed in the Malaysian Ministry of Health (MOH) vision and mission statement.

The physical environment of healthcare facilities is integral to patients' experiences (Stern, 2003). Physical environment is understood as the building, the space organization of the interior, materials, and the outdoor setting that established the spatial connection between buildings (Netherland Board for Healthcare Institution, 2008). As asserted by Schweiter et al. (2004), the hospital environment influences the actions, and interactions of the patient and their families as well as the staff members who provide care. Many studies, have illustrated the association between healthcare design to a patient's medical outcomes, for example the effects of ambient environment and arrangements of interior spaces on patients' recovery and staff performance (Alalouch & Peter Aspinall, 2007; Tawfik & Nagar, 2007; Indraprastha & Shinozaki, 2011), the relationship between the behavior and well-being of healthcare users with their feeling of comfort, relaxed and secured (Djikstra, 2006), and the potential of creation of a healing hospital atmosphere that could reduce negative psychological impact such as stress, depression, and anxiety (Ulrich, 1991).

This paper aims to establish aspects of interior architecture of a hospital, so as to enable translation of the quality care concept to interior architecture characteristics. The argument for this inquiry is that making explicit aspects of the physical environment that are responsive to the concept of quality care is crucial for the benefit of improving existing facilities, as well as future design (Abu Samah, Z, et al., 2013). Malaysia has many old and new hospital buildings. However, there is no locally drawn guideline to inform the design of healthcare facilities and as such current practices tend to rely on the information and guidelines from foreign materials and resources. This paper aims to contribute towards this research gap through reviews of established guidelines accessible in the public domain. Through this method aspects of space design characteristics desirable to meet the quality care concept were revealed and consolidated. The study focuses on the outpatient healthcare facility - the facility that attends to patients who are not hospitalized, seeking for medical care by appointment. Outpatients are cared for in a designated zone of a hospital that accommodates the doctor's room, treatment room, registration area, waiting area and pharmacy.

2. Building performance evaluation for measuring space quality

Nelson (2006) argues that 'quality' is the objective for every building design and output. He relates quality with users as he explains that "a programme of quality in architecture means improving to the degree which design fulfils needs and expectation". Presier & Vischer (2005) also place users central to a building design, using the term 'performance'– a word that is less elusive and easier to quantify, to reflect the quality of a building design and output. They introduced building performance evaluation (BPE) as a measurable design criterion to ascertain how well a completed building meets its users' needs and performance targets. A design criterion as described by Valins (1993), establishes crucial factors that guides how an architectural solution can be translated into a coherent form. The basic purpose of a healthcare facility is its ability to facilitate patient's care. The centre should also be accessible and allow privacy, confidentiality and dignity. The fundamental principles of healthcare design are efficient delivery of healthcare services, the effective utilization of the building and its services by the patient population being served and eventually the facility's ability to attract and retain the best quality medical and administrative staff. Valins (1993) suggests that design criteria for healthcare to include the location factor, accessible for physical frail and disabled users, the experience of the patient and visitor, as well as a detailed design consideration of the clinic.

BPE categorizes performance analysis according to three main categories: technicality, functionality, and behavioural. The technicality component encompasses health, safety, and security criteria while functionality refers to the efficiency of work process or work performance and functionality itself. Behavioural component examines performance in terms of psychological, social, cultural, and aesthetic aspects. These three categories are referred to in this current paper as the *space quality components*.

A literature search was performed to identify parameters that relate to each of the SQC as highlighted by previous researchers. The publications identified in the search were classified according to the 3 space quality components, and 10 space quality parameters as illustrated in table 1. Table 2 presents a brief description for each of the 10 parameters.

Table 1. Space quality components

Space Quality Components	Space Quality Parameters	References
Technicality (health, safety and security)	• lighting,	Delvin & Arneil, 2003; Netherland of board, 2008; Charles, 2011; Schweitzer et al., 2004; Reiling J, 2006;
	• Thermal comfort and air quality	Zimring C et al.,; Ulrich and Barach, 2006 Reiling J, 2006; Evans et al., 1998
	• noise	Zimring C et al., 2005; Ulrich and Barach, 2006; Netherland of Board
	• safety	
Functionality (work flow performance)	• Space planning	Netherland of board, 2008; Helvacioglu & Olgunturk ,2010; Ornstein S. W. E et al, 2007; Tawfik et al., 2007; Gifford ,1997; Weisman, 1981; Australasian HFG 2010 Baskaya et. al., 2004;
	• Accessibility	Helvacioglu & Olgunturk ,2010; Tawfik et al., 2007; Healthcare Commision, 2005; WBDG Hunter, S. 2010 Netherland of board, 2008; Rooke,
	• Wayfinding	C. N., 2009; Carpman and Grant, 1985; Baskaya et. al., 2004; Oberascher L, 2002 Charles, 2011
	• Furniture	
Aesthetic (psychological, aesthetic performances)	• Colour	Helvacioglu & Olgunturk ,2010; Charles, 2011; Netherland of board, 2008; Oberascher L, 2002; Karlin, 2006
	• Material & finishes	Netherland of Board, 2008; Charles, 2011; Drahota, 2007;

Table 2. Description of space quality parameters

Space quality parameters	Items/ Description
Lighting	The provision of windows providing natural or interesting views is almost universally welcomed by building users, and that the presence of a view may have beneficial effects on the health of dementia sufferers and people confined within a building (Torrington, J. M. and Tregenza P. R., 2007). Poor lighting has result to fatigue and loss of concentration especially to elderly (Schweitzer et al., 2004). Human performance and has positive effects on both patient and staff with a preference for natural light over artificial light (Netherland of Board, 2008).
Thermal comfort and air quality	Poor air quality and ventilation allow the transmission of bacteria and put patients and staff at risk of hospital-acquired infections. The type of air filter, direction of airflow, air pressure, air changes per hour, humidity, and ventilation system maintenance have all been linked to infection rates (Geboy, 2007).
Noise	Higher dB(A) levels detrimental effect at least patient outcomes, for example, increasing heart rate and producing sleeplessness. There is some evidence that staff perceive higher sound levels in patient units as stressful (Blomkvist V. et al, 2005;Netherland of Board, 2008).

Safety	Safety Environments affect the safety of patients and staff. Design has a particular role in reducing: 1.Airborne and contact-spread hospital-acquired infection 2.Patient falls 3.Staff errors - (Zimring C et al., 2005, Ulrich and Barach, 2006)
Space planning	Spatial layout is directly relevant to all three physical characteristics of appearance differentiation, visual access, and layout complexity (Montello, 2007). Peoples' ability to identify their location in order to navigate in a given environment both cognitively and behaviourally (Tawfik et al., 2007).
Accessibility	Visual access is the degree to which different places and features in an environment can be seen (Montello, 2007). The accessibility is related to the activity sequence which is related to the patient and visitors movement around the building from their arrival until the completion of their visit. The accessibility for the physically disabled is the focus (Valins, 1993). Circulation areas, corridors, stairways and entrance areas should be illuminated, in a way to facilitate safe and comfortable movement (Oberascher L, 2002).
Wayfinding	Architectural wayfinding design addresses built components, including spatial planning, articulation of form-giving features, circulation systems and environmental communication (Hunter, 2010). Simple, clear and consistent signposting, combined with written and verbal information – sign and location (Netherland of board, 2008). Good wayfinding systems should go beyond mere signage and the use of colour codes to differentiate various hospital areas (Carpman and Grant, 1985).
Furniture	Furniture ergonomically designed. Chair with armrest because the armrest serves as an aid in getting in and out of the chair. The design of furniture should be carefully considered in terms of safety and wellness (Charles, 2011). Surface easily clean, with no surface joints and seams, surface that are nonporous and smooth (EBD checklist).
Colour	A colour concept can form the basis of direction signs and orientation systems, thus contributing to safety, effectiveness, well-being and identification with the place of residence (Oberascher, 2002). Colour should create a pleasing and comfortable environment (Charles, 2011). Contrasting colour and intensities may help to distinguish different spatial functions and elements, to define and separate different areas, indicate directions and floor levels, mark intersections, circulation paths, destination and information points. Only a small number of highly contrasting colours should be used because people – especially under stress – would not be able to distinguish and remember subtle nuances (Oberascher, 2002).
Material & finishes	Material and finishes avoid slippery flooring, installation of handle (assistive device). Hard flooring should consider glare, contrast, and slip resistance (Charles, 2011).

3. Research method and analysis

The study used a literature and document review technique that has been employed by several researchers to achieve a similar research objective. Bosch (2003) for example, reviewed guidance for sustainability in public facilities.

The procedure to identify guidelines for review and the manner of extracting items from the guideline are as follows. Firstly, interviews involving 2 architects, 2 interior designers, and 2 medical planners from Public Works Department (PWD) and MoH were conducted to gain insight on the status quo of hospital project and issues regarding hospital design references and guides. This process revealed design guide documents frequently referred to by the Malaysian public hospital planners as guide. Online search was then performed that paired terms associated with the subject of the study (design guide, design guideline and space planning guide) with the context of the study (medical, outpatient, healthcare and hospital facilities). Gathered materials were then shortlisted based on comprehensiveness and accessibility of the guidelines, and the recognition of the institutions that produce the documents. Eventually three main design guidelines from the USA, UK, and Australia were shortlisted for review FGI (Facilities Guidelines Institute, ADA (American with Disabilities Act), HBN (Health Building Notes), and AusHFG (Australasian Health Facilities Guidelines)). The selected guidelines were reviewed whereby items of the design guidance descriptions were extracted, categorized, and regrouped based on the building performance evaluation (BPE) criteria as discussed in the earlier section. The categorizing and regrouping process were conducted by three architectural experts.

3.1. FGI Guidelines for design and construction of health care facilities version 2012

FGI Guidelines for Design and Construction of Health Care Facilities is a publication by the Facilities Guidelines Institute (FGI). Founded in 1998, FGI is a non-profit corporation based in Dallas. The aim of the guide is to regulate health care facility design and construction around the United States. According to its 2010 report, the guide is well referred by more than 42 states and federal agencies in the USA. FGI regularly revise their guidelines every four years to sustain its relevance. FGI functions as a contractual coordinating entity, committed to enhance the content and format of its guidelines publications so as to encourage and improve their adoption. The revision process allows for public participation, involving expert advisory panel amongst professionals such as the AIA/CAH (American Institute of Architect Committee on Architecture for Health).

3.2. ADA (American with Disabilities Act)

ADA is a standard accessibility design based in Washington D. C., USA. The guidelines purpose is for accessibility to places of public accommodation and commercial facilities by individuals with disabilities. The guidelines are to be applied during the design, construction, and alteration of building and facilities to the extent required by regulations issued by Federal agencies, including the Department of Justice, under the American with Disabilities Act of 1990.

3.3. HBN (Health Building Notes)

HBN is a standard of building guidelines based for UK. Health Building Notes give “best practice” guidance on the design and planning of new healthcare buildings and the adaptation/extension of existing facilities. It provides information to support the briefing and design processes for individual projects in the NHS building programme. The Health Building Note framework is based on the patient’s experience across the spectrum of care from home to healthcare setting and back, using the national service frameworks (NSFs) as a model. The Health Building Notes have been organized into a suite of 17 core subjects (care group based, support system based, generic activity based and etc. Basically care group based, which provide information about a specific care group, or pathway but cross-refer to Health Building Notes on generic (clinical) activities or support systems as appropriate.

3.4. AusHFG (Australasian Health Facilities Guidelines)

The first guidelines were endorsed in 2007 by participating health jurisdiction and issued for industry use and ongoing reviewed. The guidelines can be accessed freely by the public from the website. The AusHFG area essential to the successful briefing and design of Australasian publicly funded health facilities and area widely on most Australian health projects. The agency impact on many industry and community stakeholders that include building professionals, clinicians, health service managers, and also general tax-paying and health facility-using community. Various forms of evidence have been used in guideline development and this area synthesised within the decision-making processes that create guidelines scope and contents. The lesson learn later was applied to multi-stakeholder projects.

4. Findings

Design guideline for healthcare is a document prepared to serve as a guide for the planning and design of healthcare facilities. They are performance-bias rather than prescriptive. This means that authorities adopting these standards as codes may approve plans and specifications that contain deviations if it is determined that the respective intent or objective has been met (FGI, 2001). Final implementation may be subject to requirements of the authority having jurisdiction.

Aspects of design as suggested in the FGI, ADA, HBN and AusHFG guides were extracted and consolidated into a checklist form. This process uncovered a total of 105 design items - 16 items addressing space planning, 15 items addressing accessibility, 8 items addressing wayfinding, 18 items addressing furniture, 9 items addressing lighting, 5 items addressing noise, 10 items addressing thermal comfort and air quality, 5 items addressing safety, 5 items addressing colour, 14 items addressing materials and finishes (table 3). FGI/ADA guidelines emphasises on accessibility and material & finishes compared to HBN that emphasises on furniture whilst AustHFG emphasises most on the aspect of furniture and safety. Both HBN and AustHFG documents outline a broad and comprehensive guidelines for guidance documents.

Table 3. Space quality parameters description items

Space Quality Components	Space Quality Parameters	No of desciption items			
		FGI/ADA	HBN	AustHFG	Total
Technicality	Lighting	1	7	2	9
	Noise	-	5	3	5
	Thermal comfort and air quality	2	6	3	10
	Safety	1	2	13	5
Functionality	Space planning	2	11	9	16
	Accessibility	6	7	11	15
	Wayfinding	1	6	3	8
	Furniture	1	12	12	18
Aesthetic	Colour	-	3	2	5
	Material & finishes	6	8	8	14
	Total items	**20**	**67**	**67**	**105**

5. Conclusion

This paper has established the aspect of space quality components (SQC) and it parameters. They are important elements related to the interior conditions of an outpatient clinic. The healthcare sector in Malaysia has continued to flourish for more than 20 years now, based on the two-tiered system that balances the contribution between the public and private sector. The government is set to transform the healthcare sector from social service oriented to an economic generating venture. This will challenge public healthcare providers to raise their standard in terms of providing better healthcare facilities. Defining and clarifying what is meant by quality design is essential for assessment, benchmarking and quality improvement purposes, hence the significance of this paper.

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The paper presents in part an ongoing research that aims to derive a framework for outpatient facilities that could serve as a tool in support of evidence-based design (EBD) for secondary care at outpatient unit,

applicable for Malaysia and other countries with communities/ patients from similar culture values and origins. The research is made possible with the financial support provided by Universiti Teknologi MARA under the Research Intensive Fund (RIF no: 2013).

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